

5 Designing farming systems that differ in emphasis on profit, planet and people

J.W.H. van der Kolk¹, W. van Eck¹, and J.H.J. Spiertz²

The transition process towards a more sustainable agricultural system needs inspiring examples to facilitate discussion among stakeholders. Here, we present a number of possible future farming systems that differ in emphasis on profit, planet and people aspects, as a result of different economical, environmental and social-cultural conditions. These examples should be seen as possible developments and not as blueprints for future farming systems.

Introduction

This chapter addresses the "What?" question of the Roadmap (see chapter 2); what agricultural systems may be seen as inspiring examples of sustainable agricultural systems for the future (ca. 2030). The designs of future systems are meant to stimulate the discussion among stakeholders. By showing and discussing the pros and cons of contrasting designs, stakeholders become involved in thinking about the future. They should provide challenging and provocative images of the future systems. By no way they are meant as blueprints for future farming systems. Under current conditions, they may be unrealistic, but they may become realistic in the future, following institutional, social-cultural, technological and/or economical adjustments in society. Inspiring designs facilitate the discussion; they may help identifying attractive and less attractive future scenarios.

As a starting point, we used the triple P concept discussed in chapter 2. For both People, Planet and Profit, we formulated three common objectives.

¹ Alterra,
Wageningen University and
Research Centre,
P.O. Box 47,
6700 AA Wageningen

² Plant Sciences
Wageningen University and
Research Centre,

For People, these objectives were:

- Food security, safety and meta quality;
- Social cohesion and livability; and
- Experiencing nature and landscape.

For Profit, the objectives were:

- Income;
- Employment; and
- National trade balance.

Finally, for Planet, the objectives were:

- Environmental quality and ecological functions;
- Biodiversity of fauna and flora; and
- Conservation of natural resources.

Here, we discuss 5 different systems, which differ in the emphasis on Profit, People or Planet aspects. The 5 systems are:

- Land-based agro production (land-dependent);
- Foot-loose agro production (apart from the land);
- Farming for nature conservation (production of nature);
- Peri-urban agriculture (agriculture around cities); and
- Caring and experiencing agriculture (pluri-activity agriculture)

Food - loose agro production

Emphasis in land-based (land-dependent) agro production is on Profit, on income, though aspects of Planet and People can and have to be incorporated as well. Examples of the latter include objectives related to nature, biodiversity and landscape conservation, and multiple uses of parts of the rural area by having for example site activities such as managing a camp site. Evidently, biophysical conditions (e.g., climate, soil, topography and morphology) have to be good for this type of system. It is also important that there is a good infrastructure and processing and marketing facilities for the harvested products.

An example of land-based agro production is the design of a modern dairy farming cluster (Rienks et. al., 2003). This design was made for the central and northern parts of the Netherlands. The design is a low-cost, large-scale dairy farm, to be able to produce milk for world market prices (Figure 1). The farm has a size of 1200 dairy cows. All animal feed is grown on the farm or on farms in the neighborhood. The animal manure is digested anaerobically to generate bio fuel, and

the effluent is processed on-farm into a solid and a liquid fraction. The liquid fraction will be used as irrigation water on the farm, while part of the solid fraction is transferred to other farms. Nutrient cycles are 'tight' on the local scale (neighborhood farms).



Figure 5.1: Example of clusters of dairy farms in land-based agro-production.

Production apart from the land

Emphasis in foot-loose agro production (apart from the land) is also on Profit, on income. Possible problems related to Planet aspects are solved via technological innovations. In these systems, the price of the land is not important, as very little land is needed. A good infrastructure and the presence of suppliers and processing industry is extremely important for the location of these companies. In general, these foot-loose systems are high-tech, industrialized agro production systems with a high input and output per unit of surface area. These systems include also multipurpose industrialized systems.

An example of a multipurpose industrialized system is the design of "Californie" (Smeets, 2004 in prep). This design combines greenhouses for vegetable and fruit production with and large-scale animal protein production via pigs, poultry and fish (Figure 2). There are 8 to 10 buildings, which agricultural entrepreneurs can rent.

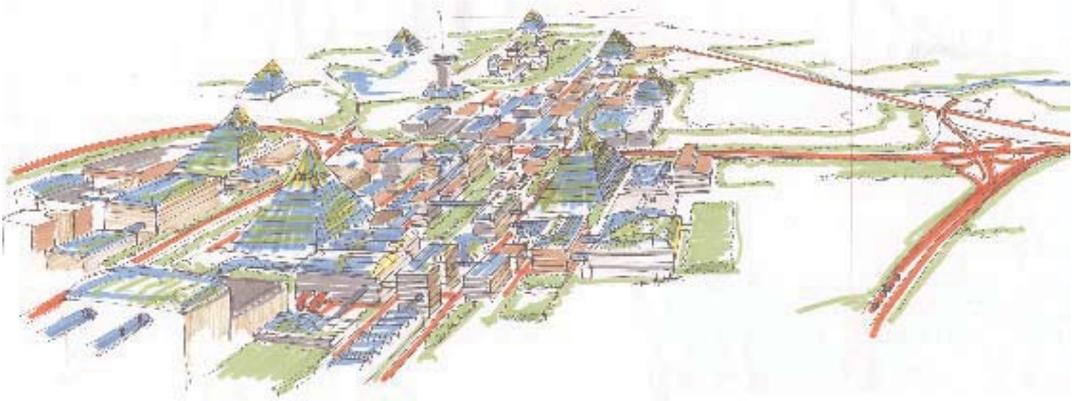


Figure 5.2: Example of a foot-loose system: "Californie"

Together, they arrange their energy, water management, logistics and infrastructure. For the protein production (pigs, poultry, eggs, fish, ect.) there is a central slaughterhouse. Transport of manure will take place subterranean and will be processed on a central spot. In this way, waste of energy and nutrients will be minimized. By concentrating different parts of the chain on one spot, the negative people aspects (e.g., animal welfare, odor) will be concentrated. Because of this concentration of intensive livestock production on a few localities, the rural areas may be used for other activities.

Farming for nature conservation

Emphasis in farming for nature conservation is on Planet, on maintaining landscape and enhancing of biodiversity. In this system, production of food and fiber is not the central issue, but nature conservation and enhancing biodiversity. This type of systems should be situated close to already existing nature conservation areas. People and planet aspects of this type of farming have been rated as very high, but profit aspects are negative. Indeed, key problem of this type of farming is the low income, and this aspect must be solved to be able to make this type of farming sustainable.

An example of this system is a mega "dairy and nature farm" in the low-lying grasslands on peat soil in the western part of the

Netherlands (Figure 3). Nature conservation is the primary function of this farm, but there is extensive dairy farming as well. Land and buildings should be provided by the government or nature conservation organizations. The dairy farm is a low-input, large-scale dairy farm, which should provide enough income to the farmer.



Figure 5.3: Example of a nature conservation farming system

Peri-urban agriculture

Emphasis in peri-urban agriculture (agriculture around cities) is on both, People, Profit and Planet. Direct contact between consumers and primary producers (farmers) is seen as education to consumers and as a direct feed back mechanism to producers. Food quality and safety, landscape maintenance and social cohesion and livability are of prime concern. The food produced is marketed directed to the nearby citizen, and there is a huge variety in products produced on different farms.

An example is the concept 'Rural Park', with a broad range of farms that produce a broad range of products (Figure 4). Fresh products will be sold directly in the park shop. Emphasis here is on high quality products, specialties with added value, direct contact between producers and consumers, and low transportation costs.



Figure 5.4: Example of a peri-urban agricultural system

Caring and experiencing farming

Emphasis in caring and experiencing farming is on People. Here, farming is more the setting for other activities. These other activities are aimed to help or to entertain people. The income of the farmers is largely based on fees visiting people have to pay. Possible activities include psychiatric care, day care for infants or for disabled persons, camping sites, facilitating conferences and meetings at the farm. These activities are in some way connected with the farming activities in a natural surrounding (Figure 5.5).

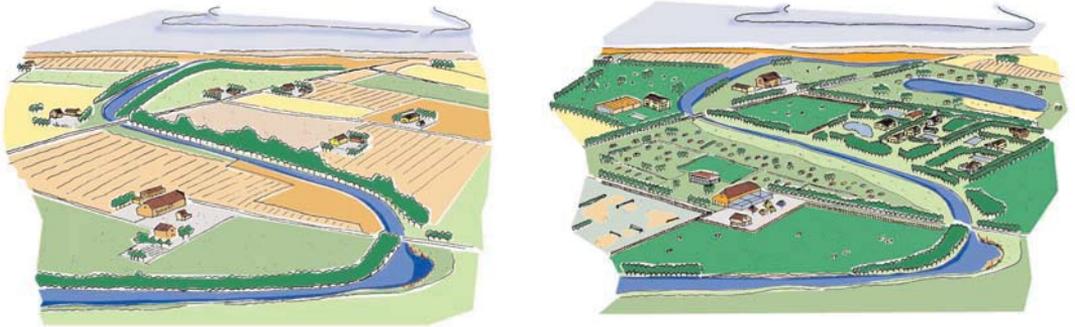


Figure 5.5: Examples for organization of the caring and experiencing agriculture: left current situation, right new setting.

Lessons to be learned

The farming systems described above have different functions and goals. They all have to meet a minimum set of criteria of People - Planet - Profit aspects, but the emphasis greatly differs between the various systems.

The triple P concept can be used to find the strengths and weaknesses of the systems. The images and assessments of the various systems also facilitate the discussion among stakeholders. They help to think about the future and about possible future developments. The Profit aspects are of key importance. Enlarging of Planet and People aspects is not effective, when no real solutions can be found for the payment of these activities. Designing future farming systems is just one step in the transition process towards a more sustainable rural area (see figure 1 of chapter 1). It is a step in a reiterating cycle; if goals are not met the cycle start again.

References

Van der Kolk, J.W.H., W. Van Eck and J.H.J. Spiertz. 2004. Duurzame landbouw in beeld. Alterra report 1024, Wageningen.

Smeets, P.J.A.M. (in prep.). Landbouw in de Noordwest-Europese Deltametropool (in prep.)